

REMARKS

Introduction

In accordance with the foregoing, claims 6-8, 10-12, 15-16, and 18-19 have been amended, and claims 20-24 have been added. Support for the added claims is found in the specification, for example in paragraphs 61 and 64, and in FIG. 10. No new matter is being presented, and approval and entry are respectfully requested.

Claims 1-24 are pending and under consideration.

Objection to the Drawings

At page 2, item 1 of the Office Action, the Examiner requested that Figures 1a, 1b, and 2 have a legend designating --Prior Art--. In view of the accompanying Replacement Figure 1a, 1b, and 2, the outstanding drawing objections should be resolved.

Objection to the Specification

At pages 2-3, items 2-3, of the Office Action, the Examiner objected to the specification. The specification has been reviewed in response to Examiner's objection. Changes have been made to the Substitute Specification only to place it in preferred and better U.S. form for issuance and to resolve the Examiner's objections raised in the Office Action. No new matter has been added.

Rejections Under 35 U.S.C. §112

At page 3, item 5, of the Office Action, the Examiner rejected claims 12-17 under 35 U.S.C. §112, second paragraph. Applicants respectfully submit that the amendments to claims 12 and 15 overcome the Examiner's rejection.

At page 6, item 10, of the Office Action, the Examiner indicated that claims 16-17 would be allowable if the rejection under 35 U.S.C. §112, second paragraph were overcome, and the claims were rewritten in independent form. Applicants respectfully submit that amended

independent claim 16, and claim 17, which depends from claim 16, are in condition for allowance.

Rejections Under 35 U.S.C. §103

At page 4, item 7, of the Office Action, the Examiner rejected claims 1-4, 6-8, 11, and 18-19 under 35 U.S.C. §103(a) as being unpatentable over Helms et al (US 4,869,801 - hereinafter Helms) in view of Kato et al (US 5,885,054 - hereinafter Kato).

At page 5, item 8, of the Office Action, the Examiner rejected claims 9-10 under 35 U.S.C. §103(a) as being unpatentable over Helms in view of Kato, and further in view of Stevens et al (US 5,810,931).

At page 5, item 9, of the Office Action, the Examiner rejected claims 5 and 12-15 under 35 U.S.C. §103(a) as being unpatentable over Helms in view of Kato, and further in view of Carr et al (US 6,158,951 - hereinafter Carr).

Applicants respectfully traverse the rejections.

Claim 1 recites an apparatus "...for loading a substrate onto a processing surface in a thin-film processing chamber, the apparatus comprising a support which cooperates with one or more corresponding apertures in the processing surface so as to be movable between an extended position in which the support can support a substrate above the processing surface, and a retracted position in which the support is flush with or located below the processing surface, wherein the support comprises a number of limbs extending radially outwardly from a central hub, at an angle relative to the processing surface, the limbs being configured to contact the edges of different sized substrates in use so as to support the substrate in a support plane substantially parallel to the processing surface, the support plane being provided above the central hub."

Helms discloses an apparatus very similar to that described as prior art in the specification, and illustrated schematically in Figures 1A and 1B. Helms discloses an unloading arm 7 used to place a substrate (e.g. a silicon wafer) 8 onto raising pins 18, 18' and 18" (FIG. 2, and col. 2, line 47 to col. 3, line 32). The raising pins 18 may be raised and lowered, together with the cage 17, relative to the substrate support 14. To position the substrate 8 ready for processing, the raising pins 18 and cage 17 are lowered such that the substrate 8 comes to rest on the substrate support 14, and the clamping ring 35, which forms part of cage 17, holds the

wafer in place.

Kato discloses a carrying device for semiconductor wafers including a wafer stage 1, on which a wafer may be inspected. The wafer stage 1 comprises a number of supporting arms 12 arranged about a rotatable and elevatable supporting shaft 11 (column 3, line 10-14). Each supporting arm 12 is upwardly curved, so that the wafer stage 1 can hold semiconductor wafers of different diameters (column 3, line 66 to column 4, line 4).

Kato is concerned with a different application than Helms (and the claimed invention). Kato relates to an apparatus for inspecting wafers (column 1, lines 6-9) and not to an "apparatus for loading a substrate onto a processing surface in a thin-film processing chamber..." Additionally, it should also be noted that the wafer in Kato remains supported on the supporting arms 12, whereas in Helms the arms are intended to transfer a wafer onto the surface of the substrate support 14. These are completely different applications and processes, and it would therefore not be obvious to combine the teachings.

Furthermore, the supporting arms 12 of Kato have a large curvature, and require a substantial space to be provided to allow them to move up and down. This is acceptable in Kato, where there is no surrounding structure, no cooling helium supply required, etc. In contrast, Helms discloses a very compact arrangement together with the supply of cooling helium gas (column 2, line 68 - column 3, line 4). It is evident that if there was a large space beneath the substrate support 14, which would need to be provided if the arms 12 of Kato were used in place of the pins 18 of Helms, it would be very difficult to achieve the cooling action. Applicants respectfully submit that one of ordinary skill in the art would therefore certainly not be motivated to modify Helms to incorporate the Kato arms.

Additionally, claim 5 recites "...wherein the mounting comprises a number of mounting elements extending radially outwardly from a central portion, each mounting element defining a number of mounting surfaces, and each mounting surface being associated with a respective mounting plane."

And claim 12 recites "...each mounting element defining a number of mounting surfaces, and each mounting surface being associated with a respective mounting plane..."

Carr discloses wafer support blocks 50 with lips 55 provided to center the wafer and prevent horizontal movement of the wafer. The wafer support blocks 50 define a single wafer support plane (col. 3 lines 11-21). This is in contrast to the Examiner's suggestion that more

than one mounting plane may be defined by the wafer support blocks 50.

Applicants respectfully submit that claim 1 patentably distinguishes over the cited art, and should be allowable for at least the above-mentioned reasons. Further, applicants respectfully submit that claims 2-15, and 18-24, which depend ultimately from independent claim 1, should be allowable for at least the same reasons as claim 1, as well as for the additional features recited therein.

Conclusion

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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